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ABSTRACT

Literature describing the scope and characteristics of employer-based training (EBT) in the United States and the evidence to date about the effectiveness of such training was reviewed in order to help categorize the types of programs or strategies that show promise in terms of improving skills or increasing productivity. For the review, training was defined as short-term programs that emphasized the specific skills needed in a particular job or occupation and do not lead to a degree. Some of the findings of the literature review are the following: (1) companies provide training because firm-specific skills are needed, because of changes in technology, and to retain employees; (2) basic skills are best learned in a context relevant to the work environment; (3) training is more effective in terms of increased wages and productivity when it is sponsored by employers; (4) employer-based training is increasingly part of a range of organizational improvement, technology adaptations, and workplace restructuring initiatives; and (5) training is a worthwhile investment for employers as well as for employees. (43 references) (KC)

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Involving Employers in Training: Literature Review

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Involving Employers in Training: Literature Review

Research and Evaluation Report Series 97-K

U.S. Department of Labor
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Employment and Training Administration
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1997

BACKGROUND ON THE REPORT AND ITS PREPARATION

This literature review was prepared in support of the U.S. Department of Labor's (DOL) efforts to disseminate information about effective strategies and practices for training and retraining the American workforce. This review synthesizes findings from the employment and training literature on employer-based training and serves as a prelude to our study of 17 U.S. companies sponsoring employer-based training (EBT) programs. Nine of these EBT programs were established and operated by firms in partnership with the Job Training Partnership Act (JTPA) system; the other eight were not affiliated with the JTPA program and mostly privately-funded by the companies sponsoring the program. Two additional reports, analyzing the companies' best practices and presenting individual summaries of each of the 17 companies, appear in separately bound reports available through the U.S. Department of Labor. These reports are entitled *Involving Employers in Training: Best Practices* and *Involving Employers in Training: Case Studies.*

This literature review was prepared under the direction of the Department of Labor's Employment and Training Administration (DOL/ETA), by James Bell Associates, Inc. (JBA). The authors are Nancy Pindus (of The Urban Institute) and Kellie Isbell (of JBA). The report was prepared under Department of Labor Contract Number F-4965-5-00-80-30 (Task Order #1).

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The Authors

LIST OF ABBREVIATIONS

AFDC	Aid to Families with Dependent Children
BLS	Bureau of Labor Statistics
CPS	Current Population Survey
DOL	U.S. Department of Labor
EBT	Employer-Based Training
ETA	Employment and Training Administration (of the Department of Labor)
JOBS	Job Opportunities and Basic Skills (the job training program for AFDC participants)
JTPA	Job Training Partnership Act
OJT	On-the-job training
PIC	Private Industry Council
PSID	Panel Study of Income Dynamics
SDA	Service Delivery Area
SIPP	Survey of Income Programs and Participation
TQM	Total Quality Management

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INVOLVING EMPLOYERS IN TRAINING: LITERATURE REVIEW

I. INTRODUCTION

This literature review helps categorize types of programs that improve worker skills or increase their productivity.

This report summarizes the literature describing the scope and characteristics of employer-based training (EBT) in the United States and the evidence to date concerning the effectiveness of such training. The purpose of the literature review is to help categorize the types of programs or strategies that show promise in terms of improving skills or increasing productivity. This paper takes a broad view of employer-based training so as not to exclude innovative programs that might serve as models suitable for wider application.

Several previous studies have addressed aspects of this subject in detail. For example, Barnow, Giannarelli, and Chasanov (1992) summarized findings of the training supplement to the 1991 Current Population Survey and the Workplace Literacy Survey; Bishop (1994) reviewed the literature on incidence and impacts of employer training; Lynch and Black (1995) reported findings of the Educational Quality of the Workforce National Employers Survey (EQW-NES); and Lynch (1995) reviewed available sources of training data. Under a project conducted for the Office of the Assistant Secretary of the Department of Labor, Long, Barnow, and Giannarelli prepared a review of data sources and preliminary tabulations on the scope of private sector training. This literature review builds on and complements these efforts, with an emphasis on providing a framework that can be applied in identifying, documenting, and describing exemplary programs.

This review emphasizes training for workers similar to JTPA participants and was limited to formal training.

Both JTPA and private training are included in this review, with an emphasis on training for those with characteristics similar to JTPA participants, particularly those programs that offer occupational skills training. This review was limited to formal training. The Bureau of Labor Statistics (BLS) Survey on Employer Provided Training defines *formal training* as training that is planned in advance and that has a defined curriculum (Frazis, Herz, and Horrigan 1995). Although a substantial amount of worker training is informal

in nature, information on informal training is limited (see Brown 1989 for a summary of estimates of the extent of informal training).

II. WHAT IS MEANT BY EMPLOYER-BASED TRAINING (EBT)?

One definition of training: preparation for work that does not lead to a degree.

There is no standard definition of "employer-based training." The term combines two concepts, "training" and "employer-based," which are frequently used to describe employment-related programs.

The Committee on Postsecondary Education and Training for the Workplace[1] defines training as: "preparation for work that takes place in programs other than those leading to transfer-oriented associate, baccalaureate, or advanced degrees." More specifically, *postsecondary* training is defined as: "organized activities, supplied by schools, employers, or other agencies and organizations, designed to prepare individuals with high school diplomas or who are older than the typical high school student so that they can obtain or advance in jobs that do not require a baccalaureate or advanced degree" (Hansen 1994).

The closer one gets to education that is occupation-oriented, the greater is the problem of distinguishing between *education* and *training*. Education has the connotation of being longer term in nature and emphasizing the development of cognitive skills (although job or occupation-specific preparation may be offered as well), leading to a credential such as an associate, bachelor's or graduate degree. It is typically thought to take place in schools and colleges.

Training connotes a short-term program that emphasizes the specific skills needed in a particular job or occupation.

Training connotes a shorter-term program that emphasizes the specific skills needed in a particular job or occupation (although these skills have cognitive as well as technical dimensions). Such programs may lead to a certificate, diploma, or technical associate's degree, but they do not necessarily carry with them any formal credential or academic credit. Training takes place not only in schools and colleges, but in many other settings as well, such as community-based organizations and workplaces. It can occur in a classroom setting or on-the-job.

Training categories include: qualifying, skills improvement, retraining, and second-chance training.

There are different ways that training has been classified in the literature. For example, the Committee on Postsecondary Education and Training for the Workplace (Hansen 1994) describes four types of training based on characteristics of the trainees:

- *Qualifying training*, initially preparing people for work;
- *Skills improvement training*, for employed individuals who want further education and training to upgrade their skills and increase their job mobility;
- *Retraining*, for those who have been or are about to be displaced from their jobs and so need to prepare for a new line of work; and
- *Second-chance training*, for individuals who need some combination of basic education and job skills, perhaps in combination with other social services, to reach economic self-sufficiency through employment.

General training is portable, and job specific training is particular to a firm or industry.

Another way of classifying training is by content of the training, for example, distinguishing between general and job specific training. General training is portable (meaning that a worker can use the skills gained with another firm or job) and includes training such as basic skills training, stress or time management, and general computer skills training. Specific training is firm or industry specific and is generally not portable (such as learning to use a piece of machinery or software peculiar to the firm).

BLS defines six primary categories of formal training.

The BLS Survey on Employer-Provided Training defines the following categories of formal training:

- *Orientation training* that provides information on personnel and workplace practices and company policies;
- *Safety and health training* that provides information on safety and health hazards,

procedures, and regulations;

- *Apprenticeship training* that is a structured process combining classroom instruction and on-the-job training;
- *Basic skills training* in reading, writing, arithmetic, and English language skills;
- *Workplace practices training* in policies and practices that affect employee relations or the work environment; and
- *Job skills training* that upgrades or extends employee skills or qualifies workers for a job.

Formal job skills training includes management and professional skills as well as food services and production-related skills.

In addition to gathering information on the six major categories of formal training, the survey collected detailed information on various types of formal job skills training, using the following categories:

- Management skills training;
- Professional and technical skills training;
- Computer skills training;
- Sales and customer relations skills training;
- Clerical and administrative support skills training;
- Food, cleaning, protective, or personal services training; and
- Production-related skills training, such as operation or repair of machinery or equipment and training in production processes.

Thus, training is generally viewed as employment or job-oriented, can occur in a variety of locations, and can be classified by target group or by program/curriculum content.

Employer-based training connotes employer involvement in the training.

The term *employer-based* also requires clarification because it is not necessarily limited to training provided at the worksite. Rather, the term connotes the existence of employer *involvement* in the training, such as by defining training needs and procuring training services, developing curricula, or supporting employees' enrollment in "approved" training programs.

Another term used in the literature describing publicly funded training programs is "employer-centered," referring to training programs that emphasize working directly with employers and unions (where they are established) and treating firms as clients. Such programs include those aimed at helping businesses train new hires as well as those that retrain workers to improve productivity and competitiveness. In the past decade, there has been a trend in state and local agency employment and training programs to work directly with firms as well as with individuals (Osterman 1992).

More employees obtain qualifying and upgrading training through employer-based training than through schooling.

A study of work-related training in the United States conducted by the American Society for Training and Development (Carnevale 1989) found that a higher percentage of employees obtain qualifying and upgrading training through employer-based training, formal and informal combined, than through schooling. Critical elements of employer-based training are that the training is employer-initiated and that training is customized to meet employer needs. This type of learning directly supports the employer's institutional culture and strategic goals. It begins with a careful analysis of the gap between job requirements and the employee's skills, and ends with an evaluation of the employee's performance on the job (Carnevale 1989).

Employer-based training can be described or classified along several dimensions, including location, funding source, and organizational relationships.

EBT can be provided at the work site or another location, though it is usually located at or near the job.

Location. EBT can be provided at the worksite, another employer-provided site (e.g., a central training facility), a community college, a university, a public school facility, or a commercial trade school. According to Carnevale (1989), most learning on the job is still located as close as possible to the job itself.

Less than half of employees' formal training is provided by company training departments.

Company training departments tend to supply less than half of the formal training and development that employees receive. Two types of training tend to be centralized at the corporate or division level of a company: training intended to provide skills beyond the current job; and training on new products, strategies, or technologies that requires training large groups of employees quickly and consistently.

For off-site training, in 1993 there were over 1,400 accredited, degree-granting 2-year institutions of higher education in the U.S., two-thirds of which were publicly funded (Rodenhouse 1995). In addition, there were 6,210 noncollegiate secondary schools in 1993. This category is dominated by private for-profit organizations, which make up over 80 percent of the noncollegiate institutions (U.S. Department of Education 1994).

Both public and private funds are used for EBT programs and include federal and state subsidies to encourage training.

Funding Source. Both public and private funds are used for EBT programs. Public funds include federal and state job training programs as well as state government subsidies to employers to encourage training. State subsidies generally target businesses that will boost the state's economic base, and businesses usually provide pre-employment training, new hire training, or skill upgrading.

Public incentives for training include subsidies, tax credits, and skill cooperatives.

Barnow, Chasanov, and Pande (1990) note that there are many state-based programs providing financial incentives for workplace training. Approaches include providing direct subsidies to employers, offering tax credits, and building skill cooperatives between business and education.

Private sources include employer funding and payments by individual employees. Employer support may be in the form of employer-developed or sponsored programs, employer payment of tuition, or paid time off for employees to attend training.

Grants and loans provided to students attending proprietary schools and community colleges represent the single largest source of federal support for postsecondary training (Hansen 1994). These include grants to students, such as Pell grants and Supplemental Educational

Opportunity Grants, and federally guaranteed loan programs such as the Stafford, which provides loans to students, and the Parent Loans for Undergraduate Students (PLUS) program; federal work study programs; and federal direct loans to students.

The JTPA program targets disadvantaged, unemployed youth and adults.

Within publicly-funded programs, the JTPA program is the major federal program targeted to economically disadvantaged youth and adults and dislocated workers. While some JTPA and Job Opportunities and Basic Skills (JOBS) funding is provided to employers as subsidies for work-based training, most JTPA programs and other publicly-funded job training programs provide work preparation training to individuals who are not working. The most common training activities provided under JTPA are classroom training (both occupational and basic skills) and on-the-job training.

JTPA requires involvement of the private sector on private industry councils (PICs), which oversee each local training system, but the extent of direct involvement of the employer community varies across local service delivery areas.

JTPA supports customized training and on-the-job training -- collaborations between JTPA and employers.

JTPA supports customized training and on-the-job training, where employers are reimbursed for part of eligible new employees' wages to cover the costs of formal and informal training. Institutionally-based training, such as training at community colleges is also provided under JTPA, either through "class size" training, where JTPA funds an entire class, or by purchasing "slots" in a classroom.

The JTPA target population is more likely to be young, non-white, have less education, and be in non-professional jobs than the general population.

Barnow, Giannarelli, and Chasanov (1992) used Current Population Survey (CPS) and Workplace Literacy Survey data to compare the training and literacy of the population eligible for the JTPA Title II-A Program to the overall U.S. population. They found that members of the JTPA target population are more likely than the general population to be young, non-white, and in a non-professional occupation, and to have lower educational attainment.

The JTPA target population reported less training than those not in the target population. Only 35 percent of

the JTPA target population needed training to obtain their jobs, compared to 59 percent for the remainder of the population. The CPS indicates that these individuals are significantly less likely than the general population to be currently in or to have most recently been in a job that required qualifying training (i.e., they tend to be in lower-end jobs requiring less skill).

Workers in the JTPA target population are less likely to have an employer pay for their in-school training.

Individuals in the JTPA target population who did report training had somewhat different sources of training than other workers. Among workers taking in-school training, the JTPA target population was less likely to report that the training was taken from a four-year college and more likely to report a vocational program. Workers in the JTPA target population were less likely than other workers to have an employer pay for their in-school skills improvement training and more likely to report that their in-school training was sponsored by a government program such as JTPA.

Government job training programs can help increase the amount of training received by the JTPA target population.

Targeting, both to special populations, and to firms that would not otherwise provide training, is a key reason for publicly-funded programs. The JTPA target population receives considerably less access to training than other members of the labor force, and government programs, such as JTPA, can help reduce this disparity (Barnow, Giannarelli, and Chasanov 1992).

Not all publicly-funded programs serve this purpose, however. Osterman reports, "Our observations suggest that agency-based training programs are relatively indifferent to serving individuals who face systematic difficulties in the labor market. This is because programs often focus on business attraction or retention, and because of a perception on the part of state officials that firms will shy away from programs that pay particular attention to low-income or underserved groups. State training programs avoided association with JTPA and the Job Opportunities and Basic Skills (JOBS) program, clearly distinguishing between the economic development and competitiveness purposes of their own training programs and the 'social service' objective of JTPA and JOBS" (Osterman 1992).

Community colleges can provide non-stigmatizing training for JTPA and other populations.

Generally, community colleges, by virtue of their dual function as educational institutions as well as training agencies, tend to be more open to admitting a diverse group of students and trainees. Osterman and Batt (1993) found several examples in which JTPA clients and welfare mothers were able to use community college programs without being stigmatized or identified as "disadvantaged."

Organizational Relationships. An important context for innovation in EBT is the range of organizational relationships associated with the design, sponsorship, and delivery of training. There are a number of ways that employers can be connected with training beyond simply sponsoring their own training programs.

A key role for employers is as customers for the "products" of the training system.

A key role for employers is as *customers* for the "products" of the training system (Hansen 1994). As customers, employers can: specify achievement standards or course requirements for hiring, provide work-based training to students, provide instructors for school-based training, make state-of-the-art equipment available to students, and help educators understand industry and occupational skill demands by participating in curriculum development or serving on advisory and governing boards, such as JTPA's Private Industry Council.

Connections between employers and training are generally weak in the U.S.

In general, such connections between employers and training are weak in the United States, but there is tremendous variation across localities and occupations. Licensing requirements exist only in health and a few other occupations in the sub-baccalaureate labor market. More than 170 certification programs have been identified by the Education Department's Office of Vocational and Adult Education, but most of these are not national in scope and have little influence on entry into or advancement in national labor markets. Consequently, they have weak links to educational curricula and instruction (MacAllum and Ma 1995). Evidence of employers influencing the curricula of community colleges is mixed, but in North Carolina and South Carolina, for example, community colleges match their curricula to the changing needs of employers (Hansen 1994, Osterman 1992).

Recent activity in the area of skill standards takes a systematic approach to coordinating the needs of the workplace, the needs of workers, and reforms in training and education. The Secretary's Commission on Achieving Necessary Skills (SCANS), was appointed in 1990 to determine what skills are needed in the workplace, the acceptable levels of proficiency, and the most effective means of measuring these skills. The SCANS developed a general framework of workplace skills, and the Departments of Labor and Education have provided a set of grants to 22 employer groups as the first step in developing industry-based standards (MacAllum and Ma 1995).

A proposed youth apprenticeship system builds on the development of industry skills standards.

One of the proposed reforms to our education and training systems which builds upon the development of skills and standards is a youth apprenticeship system. Such a system would (and in some places already does) embody a contractual arrangement between employers, workers, and schools, whereby a 17 or 18 year-old (high school junior or senior) combines work-based and school-based learning over a two- to three-year period in order to achieve a certified competency in a career field along with a high school degree (Lerman 1996). Apprenticeships would emphasize active rather than passive learning, whole projects instead of fragmenting knowledge into pieces, and teaching skills in context instead of material unimportant to the learners (Resnick 1990).

Apprenticeships are one way to combat information loss between firms and workers regarding training.

Apprenticeships would improve the link between training and careers because employers are unlikely to offer apprenticeships in areas where there are few jobs and because, for competitive reasons, employers will choose to train apprentices in the most up-to-date practices. Steedman (1993) sees this type of employer-based training as overcoming the information loss between firms and workers concerning the content of training.

Federal, as well as state and local, efforts to incorporate the SCANS framework are asking employers to set both skill standards needed for success in their jobs and performance standards by which training agencies will be judged and rated. The use of employer associations or other collaborative efforts among employers responds to this need

and can offer new organizational approaches to EBT.

Employer associations provide a needed conduit between government programs, companies, and training providers.

Osterman (1992) suggests that, by using employer associations as brokers for training programs, states can build institutions that outlive particular projects and that can serve as intermediaries between states and employers. This can be particularly helpful in reaching small firms because employer consortia have the trust of their member firms. Established employer associations can develop and initiate training programs, with the government playing a largely passive funding role; or public agencies can play a more active role in developing employer associations. In the latter model, participation can be broadened to include community groups, unions, educational institutions, and a range of government agencies.

Joint labor-management training programs are good EBT models.

Another organizational model for EBT is joint labor-management training programs. These programs are governed jointly by unions and employers, focus on employee-oriented training and personal development objectives, and include a broad range of active workers. Ferman et al. (1991) report that joint union-management training programs, as compared to traditional unilaterally-sponsored programs, have increased input, especially from workers, into the content of the training. Joint training programs also have powerful systems of checks and balances in program administration; a greater capacity to link with government and educational institutions; and ultimately a higher degree of legitimacy, stability, and success.

III. INVESTING IN WORKER TRAINING: THEORY, CONCEPTS, AND ISSUES

This section discusses why workers and employers invest in training, the need for training, and factors affecting employers' decisions to provide training, including incentives and barriers to employer-based training.

The theory behind EBT says that training is an investment in human capital and enhances productivity.

Theoretical Basis. The fundamental theory guiding economists is that worker training is an investment in human capital that enhances worker productivity. Economists view an employer's decision to train workers as one of a broad class of human capital decisions (Parsons 1989). Training involves costs, including lower productivity during the training period, diversion of supervisor and coworker time during the training process, and purchased training materials. Set against these costs is the increase in worker productivity after completion of the training.

The theory states that firms are less likely to invest in general training than job-specific training.

Most attempts to empirically demonstrate this relationship use data on individual workers and use indirect measures of productivity such as wages (e.g., Brown 1989, Lynch 1992). Fundamental work in this area by Gary S. Becker (1975) states that wages increase with increases in human capital -- skills, education, and experience. Firms are less likely to invest in training for general skills that can be used by other firms and more likely to invest in job-specific training, believing that they can better recover job-specific training costs.

The demand for skilled workers and the earnings gap between skilled and unskilled workers point to the need for training.

The Need for Worker Training. Increased emphasis on worker training, particularly employer-based training, stems from the evidence that a more highly-skilled workforce is needed, and that effective training is closely linked to the workplace and to employer needs. The earnings and employment opportunities of less educated workers have declined substantially over the last decade. The earnings gap between more and less educated workers widened, as did the level of earnings dispersion among workers with the same level of education.

These trends have led many researchers to conclude that there has been a steady increase in the demand for skilled workers (U.S. DOL 1994). Due to the earnings gap, it might be less costly for employers to meet this demand by training less-skilled workers rather than by hiring more educated workers. Increasing use of computer technology, restructuring of business, and a growing global economy are some of the factors economists cite as contributing to changes in the employment structure of the U.S. economy since the early 1980s (Rosenthal 1995). Furthermore, there is

considerable growth projected to occur in occupations with higher educational requirements; the job classifications that currently use low-skilled workers are experiencing "upskilling," which translates into a need for more responsibility, more knowledge, and ultimately more skill; and, there has been stagnation and even a decrease in the number of jobs that are unskilled or very low skilled (Barnow, Chasanov, and Pande 1990).

Companies provide training because firm-specific skills are needed, because of changes in technology, and to retain employees.

According to the BLS Survey of Employer-Provided Training, the most frequently cited reason establishments of all sizes gave for offering formal job skills training in 1993 was that the training was necessary to provide skills specific to their organization (75 percent). Other important reasons for offering formal job skills training were to keep up with changes in technology or production methods and to retain valuable employees -- each of these reasons was cited by at least half of those providing formal job skills training.

Among establishments that provided formal basic reading, writing, arithmetic, or English skills during 1993, the most frequent reasons for doing so were to reduce error and waste (56 percent) and because basic skills were thought to be critical to technology or production methods (52 percent). About one-quarter of all establishments reported that they offered basic skills training to meet safety and health requirements (Frazis, Herz, and Horrigan 1995).

Changes in the labor force also indicate an increased need for training.

In addition to changes in job requirements, the changing nature of the labor force also indicates an increased need for worker training. Minorities who, on average, experience lower high school completion rates, lower educational achievement scores, and greater literacy problems, will account for a large portion of new labor force entrants by the year 2000. Although their test scores and school achievement have been rising, in the short-run the increased proportion of minorities entering the labor force is likely to increase the need for worker training.

Low-skilled workers often require literacy and numeracy training.

Existing workers need retraining due to rapid changes in technology, and many require basic skills education before they can participate in training or retraining (Barnow, Chasanov, and Pande 1990). General training is important

for low-skilled workers due to their low level of literacy and numeracy skills. For example, 30 percent of 21-25 year olds experience problems gathering information from several sentences and analyzing multistep problems. Almost half of all 17 year olds cannot do arithmetic involving fractions, percentages, and decimals (Murnane and Levy 1994). Yet, recent research has shown that many students who leave school without basic reading and math skills can acquire these skills if the pedagogical approach combines basic skills training with technical training related to real jobs (Murnane and Levy 1994).

Basic skills are often easier to learn when taught in the context of a job.

Bishop (1994) points out that, while school-based training improves access to skills training, school-based training cannot replace some kinds of employer training and is generally less effective than employer-provided skill training of the same duration. Basic skills are often easier to learn when they are integrated into a training program that is specific to the context of a particular job (Mikulecky 1989). Training received from an employer is much more likely to be used on one's job than is training obtained at a school (Bishop 1994). Bishop also notes several theoretical arguments for workplace learning, including more motivated trainees, the prevalence of more effective tutorial learning methods, and availability of appropriate materials and equipment.

Companies using benchmarking or TQM are more likely to provide worker training.

Impacts of Workplace Changes. There is evidence that the changing workplace has increased the need for worker training and that employers are responding to this need. According to Lynch and Black (1995), employers who use benchmarking or have introduced Total Quality Management (TQM)[2] into their establishments are also more likely to provide formal training, everything else being constant. Both TQM and benchmarking require workers to take on more responsibilities for quality control and problem solving. These skills are probably more difficult for workers to acquire informally, so employers need to develop formal training programs to meet these skill needs.

Similar findings are reported from the BLS Survey of Employer-Provided Training. The survey asked about a number of alternative workplace practices, including TQM,

quality circles, job rotation, and worker teams. Compared with all establishments, an establishment with any of eight workplace practices specified in the survey is more likely to provide formal training (Frazis, Herx, and Horrigan 1995).[3]

Workplace restructuring may mean that employees need new skills.

The scope of employer-based training has broadened as workplaces have restructured, thus changing the skills needed by workers. In manufacturing, workers not only participate in a technologically sophisticated production process, but they may also be expected to anticipate production problems and contribute ideas for adjusting production. In the service industry, competitive conditions link worker behavior more closely to company image and workers are expected to anticipate client needs and customize services accordingly. Benton, et al. (1991) conclude that the worker skills now rising in demand can be grouped into the following three categories: technical and specialized skills, conceptual skills, and communication skills. There is a growing awareness that narrow forms of training are no longer appropriate to less structured, more rapidly changing workplaces.

Companies face continual decisions regarding investing in training or purchasing skills from the outside.

Employer Decisions to Invest in Training: Incentives and Barriers. The training decision can be complex. The level, frequency, and source of training must be evaluated based on cost and anticipated productivity gains. Employers are continually faced with the decision of whether to make additional investments in training within their establishments or to purchase skills from the outside (Lynch and Black 1995).

The Educational Quality of the Workforce National Employers Survey (EQW-NES) obtained information about employment, training, and hiring practices from a nationally representative sample of private establishments with more than 20 employees. In order to relate these practices to productivity, respondents were also asked to provide other information about their businesses, including annual sales, principal products and services, investments in equipment and new facilities, cost of materials used in production, and the average wages and level of education of their workers.

EBT is a complement to, rather than a substitute for, other investments in physical and human capital.

Analysis of the EQW-NES data shows that the likelihood of employer-provided training is related to other employer investments such as high performance workplace practices (see discussion in previous section) and investments in physical capital. Employers who have made large investments in physical capital relative to the number of workers, or who have hired workers with higher average education are more likely to train workers within their establishments. This suggests that employer-provided training is a complement rather than a substitute to investments in physical and human capital (Lynch and Black 1995).

Companies typically underinvest in training because they are unsure they will recoup the full investment.

Enterprises and individuals often underinvest in training; that is, they spend less than the rate of return on training justifies (OECD 1994). This is due to uncertainty on the part of employers and employees about recouping their full investment in training. Four factors which contribute to this uncertainty are: employee mobility; reductions in workforce due to market fluctuations; short-time horizons for training investment decisions; and lack of information about defining and measuring knowledge and competencies.

Employee mobility limits training investment by companies.

The ability of workers to take acquired skills with them to other jobs is one factor believed to limit the amount of training employers conduct. According to Becker's theory of human capital, this limits employers' willingness to invest in general training. Investments in specific training are limited because training investments are lost whenever unforseen market conditions force firms to reduce their workforce, and there is no insurance available to protect against this loss.

Companies often think of training in the short-term.

Another reason for underinvestment may be that firms base their training decisions on short time horizons, preferring to "buy" the skills needed rather than "making" them through training (OECD 1994). Financial accounting and reporting practices and tax treatment of training expenditures may contribute to this short time horizon. Training expenditures are customarily treated as operating costs, rather than as investments. This means that regardless of the period over which training benefits will be enjoyed, the

costs can only be counted in the year in which they are incurred. In contrast to physical capital investments which are depreciated over the useful life of the asset, the timing of training costs is not linked to the expected benefits of training.

Companies lack information about the availability, costs, and quality of training.

Lack of information is a fourth factor which limits investment in training. There is a lack of information about the availability, costs, and quality of training. There is also a more fundamental gap in understanding the nature and extent of knowledge and competencies that are acquired in further training. As a result, it is difficult to measure the costs and benefits of training, to estimate the loss to a company when a trained worker leaves, or to indicate reliably what a trained worker knows (OECD 1994).

Perhaps it is the general uncertainty on the part of employers that accounts for the inconsistencies in survey findings. For example, surveys of employers do not support the theory that fear of losing trained workers to other firms is a barrier to general training.

Only 41 percent of EBT programs include job-specific training.

Bassi found in her case studies of firms both with and without EBT programs that only 41 percent of EBT programs included job-specific training. The two most common reasons cited by firms for not investing in any type of EBT program were: 1) the companies did not believe they needed a training program, and 2) they thought such a program would be too expensive (Bassi 1994a).

Companies generally report that informal training meets their needs.

Nearly two-thirds of establishments that reported on the BLS Survey of Employer-Provided Training that they did not provide formal skills training in 1993 indicated that (informal) on-the-job training satisfied their needs. The proportion citing this reason was even greater (83 percent) for medium (50-249 employees) and large (over 250 employees) establishments combined (Frazis, Herz, and Corrigan 1995).

Less than 10 percent of all establishments reported on the BLS Survey of Employer-Provided Training that the cost of formal training was too high or that they were unwilling to provide formal training due to a fear of losing trained

employees to other employers (Frazis, Herz, and Horrigan 1995).

In 1990, 46 states had state-sponsored incentive programs for EBT.

To overcome the underinvestment in training, additional training incentives have been provided to employers. Barnow, Chasanov, and Pande (1990) report that in 1990, 46 states had state-sponsored incentive programs for EBT (investments ranged from $50,000 in Vermont to $55 million in California). Funding mechanisms for state incentive programs include tax credits, direct grants, levy/grant, and mandatory programs. Costs, particularly start-up costs, and the need for technical assistance are commonly recognized as barriers to EBT programs. State incentive programs that provide funds for, or assistance with, program components such as curriculum design through the community college system can allay some of these concerns.

State incentive programs are often criticized for "windfalls."

Incentive programs have often been criticized for subsidizing training that companies would undertake without the incentive. These "windfalls" result in a substitution of public spending for private spending (Barnow, Chasanov, and Pande 1990). To avoid windfalls, states can: target incentives to particular firms, based on size and profitability; target specific types of workers and skills; use a levy/grant or mandatory training system; or adopt marginal credits provided only for firms doing more than they would in the absence of the incentive program. For example, smaller firms are less likely to provide training on their own; state incentive funds directed to these firms probably will not produce a windfall.

IV. EXTENT AND STATUS OF EBT IN THE UNITED STATES

This section summarizes the extent and types of EBT and the available descriptive information on training and its impacts.

Expenditures, Number, and Types of Firms and Workers. Expenditures for employer-provided training are difficult to measure due both to definitional issues and to the complexity of identifying and including all cost factors. One example of a definitional issue: in calculating expenditures,

are both formal and informal training to be included? Formal training generally refers to company-provided classroom training and on-the-job programs, while informal training generally means training provided by supervisors or co-workers during work, such as constructive criticism or showing a new hire how to perform a particular operation.

Estimates of company expenditures on training vary greatly.

Cost estimates vary greatly, and usually only include the direct costs of training, excluding worker wages while in training and lost productivity. Estimates by Anthony Carnevale (1990) indicate that firms spend over $32 billion annually on formal training programs. Bartel (1989) estimates $55 billion was spent on firm provided training in 1987, and Jacob Mincer, using Panel Study of Income Dynamics (PSID) data from 1976 and extrapolating to 1987, estimates that $148 billion was spent on formal training (Lynch and Black 1995).

Large companies are more likely to provide training.

Large firms (those with more than 100 employees) are more likely to provide training to their employees. There is not, however, a linear relationship between size of employer and training provided; very small firms are also more likely to provide training (Brown 1989). A recent survey of firms with more than 20 employees found that 81 percent offered formal training to employees; 99 percent of firms with 1,000 or more employees offered formal training.

Formal training programs are more prevalent in non-manufacturing firms.

Formal training programs are generally more prevalent in non-manufacturing firms; however, the majority of manufacturing firms do provide formal training: 61 percent of textile and apparel firms and 87 percent of primary metals firms, for example, provide training (Lynch and Black 1995).

One analysis of the 1991 Current Population Survey job training supplement estimated that 21 percent of labor force participants received qualifying training (training needed to qualify for a job) from formal company training programs (Barnow, Giannarelli, and Chasanov, 1992). In addition, 38 percent received skills upgrading training from a formal company training program once on the job.

Some workers are more likely to receive training than others.

Several studies have examined which workers receive training provided by firms. Most of these studies conclude that:

- men are more likely to receive EBT than women;
- whites are more likely to receive EBT than blacks;
- more educated workers are more likely to recgive EBT than those less educated; and
- part-time workers are less likely to receive EBT than full-time workers (Brown 1989).

Salespeople, managers, and professionals are more likely to receive training.

According to a study by *Training* magazine, salespeople receive the most training (measured in mean number of hours received) followed by managers, executives, professionals, and supervisors. Production workers, customer service representatives, administrative staff, and office/clerical staff receive the least training (Lee 1988).

Management skills and supervisory skills are the most common types of employee training.

Types of Training Available and Sources of Training. A survey by *Training* magazine of organizations with 50 or more employees found that general training is quite popular -- for executives. The two most common types of training -- management skills/development and supervisory skills -- are provided by 78.5 percent and 69.3 percent of organizations, respectively. Clerical/secretarial skills and computer literacy skills were taught by 56.7 percent and 51.2 percent, respectively. Only 18.8 percent of organizations provide remedial basic education (Lee 1988).

Other types of training provided by at least 50 percent of organizations surveyed by the magazine include:

- new employee orientation
- leadership
- word processing
- stress or time management
- team building
- new equipment operation.

Of workers receiving skills upgrading training once employed, 38 percent received their training from formal company programs, 38 percent from informal on-the-job training, 32 percent from school programs, and 17 percent from other sources (workers could report multiple sources of training). Workers receiving qualifying training were more likely to be trained at school and less likely to be trained through company programs than workers receiving upgrading training (Barnow, Giannarelli, and Chasanov 1992).

Eighty percent of EBT programs use both outside and in-house trainers to train workers.

Eighty percent of firms with EBT programs use a combination of both outside and in-house trainers as instructors. Outside trainers are more likely to be used for executives while in-house staff are more likely to provide training to other workers (Lee 1988). Community colleges are a popular option for provision of both curricula and instruction. For example, the Eastern Iowa Community College District created a set of standard curricula on a variety of topics and provides the training on-site for companies. The District will also make the training specific to a particular firm if needed (e.g., training workers to use a new piece of equipment or institute a new quality control measure).[4]

Several data sets regarding EBT exist, but analyses are limited by amount and types of information.

Data Sources and Limitations. Currently, the United States does not have a longitudinal database of individuals and firms and their training experiences and outcomes (Lynch 1995). Several data sources exist for use by researchers and policymakers in determining the amount and extent of EBT in the United States, each with its strengths and limitations. These include household-based national surveys of individuals, such as the Current Population Survey, the PSID, and SIPP; employer-based surveys, and matched employer-employee surveys. Data on job training are generally collected through telephone or mail surveys administered either to employees or employers. Table 1 summarizes available survey data for measuring the incidence and impacts of training.[5]

Analyses of these data sets are limited by the amount and types of information collected. For example, the Current Population Survey supplement does not assess actual skill levels (instead relying solely on self-report and self-

Table 1: Summary of Data Sources on Training Incidence and Impacts

Survey	Dates	Respondents/Sample Size	Comments
Household/Employee Surveys			
Current Population Survey (training supplement)	1983, 1991	Nationally representative sample of households. 57,734 individuals in the experienced labor force responded to the 1991 training supplement.	Best source of information on how training incidence has changed over the last ten years for the workforce as a whole.
Panel Study of Income Dynamics (PSID)	1976-1980		Does not distinguish between formal and informal training.
Survey of Income Programs and Participation (SIPP)	1984 (wave 3), 1986 (wave 2), 1987 (wave 2)	All workers in the household aged 22-65 who reported earnings.	Does not distinguish between formal and informal training.
Employment Opportunities Pilot Program (EOPP) individuals' survey	1979-1980	Workers employed in low wage labor markets	Detailed questions on training, but not representative of the labor force as a whole.
National Longitudinal Survey (NLS), Young Men, Young Women and Older Men Cohorts	1981 (YM, last) 1993 (YW, latest) 1990 (OM, last)	National representative sample of over 5,000 in each cohort.	Includes training questions that can be matched with employment and wage histories of respondents.
NLS, Youth Cohort (NLSY)	Annual	National representative sample of 12,686 young men who were 14-22 years of age when first surveyed in 1976.	Most detailed individual survey on training available in the U.S.; information on formal and informal training and productivity.
NLSHS72	1986	National representative sample of 22,652 people who were high school seniors during the 1971-1972 academic year.	Information on formal and informal training and wages duration of training spells.
High School and Beyond	1986	Targeted at high school seniors and sophomores in 1980.	Information on formal and informal training and wages/growth
Workplace Literacy Survey	1989-1990	2,501 randomly-selected individuals enrolling in JTPA and EDWAA programs; and 3,227 randomly-selected individuals who sought state employment assistance or applied for unemployment insurance.	Measured literacy proficiency.

Survey	Dates	Respondents/Sample Size	Comments
Employer Based Surveys			
DOL Training Survey	1994 (reference period 1993)	Mailed national survey of 8,000 establishments.	Information on formal training only; 70% response rate.
EOPP-NCRVE employer survey	1982	Telephone survey of employers (not a representative sample).	Includes questions on productivity; employee-specific information can be determined. Truncates training duration measures at 3 months.
EQW-NES	1994	Telephone interviews with a nationally representative sample of 3,200 establishments.	Includes information on, productivity and changes in training incidence over time; 73% response rate.
National Federation of Independent Business (NFIB)	1987	Mailed survey to employers who were members of NFIB and who had hired someone in the past 3 years.	Approximately 25% response rate.
SBA survey	1992	Telephone interviews with a nationally representative sample of 1,288 establishments.	50% response rate. Truncates training duration measures at 3 months.
Spencer Foundation Employer's Survey	1992	875 establishments with 50 or more employees	65.5% response rate. Covers non-managerial, direct production or service workers ("CORE" employees) only.
Training Magazine Survey	Annual since 1981	Mailed survey to members of the American Society of Training and Development with over 100 employees.	Response rates around 15%. Cannot link survey years.
Matched Employer-Employee Surveys			
BLS White Collar Pay	1989, 1990	Random sample. Final sample of 124 establishments and 601 full-time workers	Includes information on formal training and wages/growth.
National Organization Survey		Telephone interviews with a sample of workers and employers.	50% response rate.
Upjohn	Spring 1993	305 establishments and their employees. Restricted to establishments with 100 or more employees.	20% response rate. Includes follow-up contacts with employers and employees.

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perceptions of adequacy). The Workplace Literacy Survey, while assessing actual skill levels, provides no information about populations not accessing DOL programs; the results, therefore, are not representative of the entire labor force. Because respondents to the Employment Opportunities Pilot Program Survey were asked only about recent hires, the data do not include workers with high job tenures, thus oversampling high-turnover jobs.

Limitations of available data result in gaps in our knowledge of EBT.

These limitations of the available data result in gaps in our knowledge of EBT programs. Lynch notes gaps in the following information: the types of training received, current employer investments in post-school training, the nature of the change from informal to formal training, who provides and receives the training, barriers to the provision of training, and the impact of training on productivity (Lynch 1995).

V. SYNTHESIS/ASSESSMENT

Little research has been done on the link between employer-provided training and productivity gains.

This section reviews evidence of the impacts of EBT for employers and for employees. Quantitative evaluations of worker training address the relationship between training, productivity, and wages. Bishop (1994) points out that employers arrange and pay for training because it raises productivity, not because it raises wages. Policymakers' interest in training derives both from its effect on productivity and its effect on wages. Yet, researchers have noted that there have been very few studies in the United States on the impact of employer-provided training on productivity. Some of the few studies that do link training and productivity have used a subjective measure of productivity, such as "on a scale of 1 to 4 how has your productivity changed over the last year?" rather than using actual output value or value added (at the firm or worker level) in order to construct measures of labor productivity or total firm productivity (Bartel 1994, Lynch and Black 1995).

Researchers conclude that employee training increases productivity.

Using data from the 1982 Employment Opportunity Pilot Project, Bishop (1994) concludes that employer training raises productivity (using a subjective measure) by almost 16 percent. Barron, Black, and Loewenstein (1989) conclude, based on a statistical analysis of wage and productivity growth, that training and wage and productivity growth are directly related. Using data on new employees only, the

authors found that worker training was the primary factor that positively affected productivity growth. Other variables examined, including formal education, unionization, and gender appeared to play no important role in affecting productivity growth (Barron, Black, and Loewenstein 1989).

All types of training are associated with higher wages.

Lisa Lynch (1992) used data from the National Longitudinal Study youth cohort (NLSY) with a subsample of 3,064 persons to examine patterns of training and outcomes of training (measured in terms of wages and growth) on young workers. Training data were separated into three categories: company-provided on-the-job training (OJT), apprenticeships, and training obtained outside the firm (off-job training) from business courses, barber and beauty schools, nursing programs, vocational and technical institutes, and correspondence courses. Lynch found that all training is associated with higher wages; but, for the sample of non-college graduates studied, the effect on wages is most significant for off-job training from proprietary schools (including training received prior to current employment). OJT received with the current job results in wage increases with the current employer, but the training seems to be firm-specific, since OJT received at previous jobs did not have an impact on wages in the current job.

JTPA classroom training results in higher wages for adult women; on-the-job training means higher wages for adult men and women; neither leads to higher wages for youth.

Government training programs have been the subject of the most rigorous evaluation, including randomized study designs. Bishop summarizes findings from Abt Associates' evaluation of the Job Training Partnership Act (JTPA), as well as evaluations of Job Start and the Job Corps. In terms of labor market earnings, JTPA classroom training works well for adult women and on-the-job training works well for both adult men and adult women, but these methods do not work for disadvantaged youth.

Only Job Corps has significant positive impacts for youth.

Evaluations of Job Start, a program for youth aged 17 to 21 who have dropped out of high school, came to similar conclusions. Of the various programs designed to serve disadvantaged youth, only Job Corps, appears to have significant positive impacts (Bishop 1994). Job Corps is a residential, year-long program for youth that is much more intensive than any other job training program. Youth enrolled in Job Corps receive a variety of academic instruction, job training, and various other social services.

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For workers in government training programs, on-the-job training generally has better results than classroom training.

Bassi (1994) reaches similar conclusions to Bishop, noting that the research results for government-provided education and training programs are not encouraging. The largest gains that result from participating in government-provided education and/or training programs seem to accrue to those individuals who receive on-the-job training, while some of the smallest gains accrue to those individuals who participate in classroom training programs (Barnow 1987).

On the other hand, evaluation findings for the Center for Employment Training (CET) in San Jose, California suggest that well-designed programs that include work-based training can be effective (Grubb 1995). CET was a participant in the Minority Female Single Parent (MFSP) demonstration and in the Job Start program. MFSP emphasized provision of remedial education and also provided an extensive array of social services. Job Start was modeled after the Job Corps program, but was not residential.

Inclusion of remedial education, job placement, and child care can make government training programs more successful.

In both the MFSP and Job Start evaluations, CET was the one site that substantially increased the earnings of participants. The success of this program has been attributed to its efforts to integrate remedial education and vocational skill training, along with its attention to job placement and availability of child care on-site. Other reasons for its success include: long standing connections with local employers; providing a program tailored to the mostly Hispanic population served (e.g., bilingual education by mostly Hispanic instructors); and operation of businesses (e.g., cafeteria, car repair, copying, and child care) by the site, providing on-site access to work-based training (Grubb 1995).

Training sponsored by employers results in higher wage increases for workers.

Individuals who participate in education and/or training programs that are sponsored by employers (as opposed to government programs) typically enjoy fairly substantial increases in their earnings. Based on a review of wage growth studies, including the study by Lynch (1992) cited above, Bishop concludes that most studies imply that, "at least in the short run, training pays off in higher wages **only** when the employer sponsors it, not when the worker pays for it" (Bishop 1994).

Most of the research described above addresses broad impacts of training. But how do employers select training methods or programs? How are specific training programs assessed in order to implement or continue the most effective programs or to identify the most effective features of programs? The literature provides little evidence of employer evaluation of training, perhaps because such studies are costly or are found only in internal corporate documents rather than in the published literature.

Companies are more likely to use subjective measures to evaluate their training programs.

The BLS Survey of Employer-Provided Training asked employers how they judged the success of their programs. Subjective measures, such as supervisory evaluations of overall worker performance after training and workers own opinions of training, were most frequently used to measure the success of formal job skills training. Only 30 percent of establishments reported using specific measures such as fewer mistakes or increased output as methods of judging success. Only 22 percent used general effects on employee behavior, such as reduced absenteeism or lower turnover, and about 12 percent of establishments reported using written tests (Frazis, Herz, and Horrigan 1995).

These studies all use data on individual workers. Another perspective is analysis of impacts at the organizational level. The EQW-NES is the first nationally representative survey to document the contribution that a workforce's average level of education makes to the productivity of individual establishments. The survey queried managers and owners of approximately 3,000 establishments employing 20 workers or more about their employment, training, and hiring practices. In order to relate these practices to productivity, respondents were also asked about the basic nature of their business: annual sales, principal products and services, investments in equipment and new facilities, costs of materials used in production, and the average wages and level of education of their workers.

Increases in employees' educational levels leads to increases in output.

For the EQW-NES sample of manufacturing and non-manufacturing establishments with more than 20 employees, a 10 percent increase in the average education of all workers within an establishment is associated with an 8.6 percent increase in output for all industries surveyed, other things being equal. This effect is 11 percent for the non-

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manufacturing sector (NCEQW 1995).

A positive relationship between training and productivity exists at both the individual and organizational levels.

Bartel (1994) addresses labor productivity at the organizational level, measuring productivity gains from the implementation of formal employee training programs utilizing data on personnel policies and economic characteristics of businesses in the manufacturing sector. The author found that a positive relationship between training and labor productivity exists, not only at the level of the individual employees, but on an organizational level as well. Businesses that were operating below their expected labor productivity levels in 1983 implemented new employee training programs after 1983 that resulted in significantly larger increases in labor productivity growth between 1983 and 1986. This higher rate of productivity growth was sufficient to bring these businesses up to the labor productivity levels of comparable businesses by 1986.

EBT is most likely to occur as part of a work restructuring or systemic initiative.

At the organizational level, a common theme in the literature is that EBT does not occur in a vacuum-- it most likely to occur, and is probably most effective, when part of a larger work restructuring or systemic initiative. Using the EQW-NES, Lynch and Black (1995) analyzed impacts of training and other workplace practices (such as TQM and benchmarking) on productivity and wages, taking account of worker characteristics (such as education and training), and other establishment characteristics (such as age of the capital stock).

Using a production function, they found that investments in human capital exert significantly positive effects on establishment productivity. The impact of training investments by employers differs according to their nature, timing, and location. Their results suggest that formal training outside working hours has a positive effect on productivity in manufacturing, while computer training raised the productivity of non-manufacturing establishments.

Systems of interrelated practices have a greater impact on productivity than individual workplace practices.

Consistent with these findings, a review of the literature on high performance work systems and firm performance by Kling (1995) reports a positive relationship between each of three specific work practices (skill training, compensation policy, and workplace participation) and productivity, and that these positive effects appear to be

mutually reinforcing. Systems of interrelated practices appear to have a greater impact on productivity than the sum of independent impacts of each work practice.

Researchers have studied state agency and community college training programs in four states.

These concepts can be taken beyond individual firms. Based on an intensive study of four programs, Osterman and Batt (1993) looked at the pros and cons of state agency-based training and employer-centered training at community colleges. The California Employment Training Panel and the Illinois Prairie State 2000 Industrial Training Program were both agency-based, customized training programs, providing employer-centered training to specific businesses and unions. Their goals included business attraction and retention through training of new hires and the upgrading of the existing labor force. These programs were contrasted to community college-based programs in North and South Carolina, which offered an alternative strategy to the creation of new stand-alone agencies.

Osterman concluded that there are advantages and disadvantages to both settings. "The advantages of a community college system are that it is bureaucratically stable, less likely to exclude lower-income groups, and able to coordinate a variety of state and federal programs. Furthermore, it is possible to design programs within a community college structure that mimic what the stand-alone programs offer. By contrast, agency-based programs appear to be more flexible and quicker to respond to changes in technology and in demands for new skills in the workplace. They also draw upon a broader range of training providers and because of this might be more likely to offer state-of-the art training" (Osterman 1992).

According to one researcher, public policy should develop strong systems rather than isolated models.

Addressing some of the broader issues concerning the delivery of training and development of a training system, Osterman notes, "A central goal of public policy should be to build a strong system rather than simply develop isolated best practice models. Scarce funds should be expended to build institutions that outlive a particular project and that continue to address the issues long after project funds are expended. The absence of system-building in agency-based programs stands in contrast to the community college systems, which have an institutional presence that is more substantial than any given project or grant" (Osterman 1992).

Both the training delivery system and the work environment are important components.

Thus, EBT must be considered in the context of the delivery system as well as the work environment, recognizing that both are components of a dynamic system. Based on comparative case studies of the manufacturing and service sectors, Benton and colleagues (1991) conclude that "increasing resources for training without other changes in the workplace may prove relatively ineffective in promoting either improved competitiveness or establishing structures that support lifelong learning for workers and greater job satisfaction." The author identifies the following elements of successful training: management involvement, restructuring jobs to make them more interesting to employees, centralized as well as decentralized locations for training; open, flexible ties between firm-based training and formal education; and promoting a working environment that facilitates organizational learning as well as continuous learning by individual workers.

VI. CONCLUSION

While there is still a need for more research on the nature and effects of private sector training, our brief review of the literature suggests that:

The literature suggests that worker training is a good investment and is more effective when sponsored by the employer.

- Training is a worthwhile investment for employers as well as for employees.
- Training is more effective in terms of increased wages and productivity when it is sponsored by the employer.
- Basic skills are best learned in a context relevant to the work environment.
- Employer-based training is increasingly part of a range of organizational improvement, technology adaptations, and workplace restructuring initiatives.

These factors should be kept in mind when soliciting nominations of "best practices" programs and conducting case studies of effective EBT strategies. Finally, the purpose of identifying best practices is to promote the diffusion of effective strategies and models. The programs identified must

demonstrate (even if only anecdotally) positive effects for both employees and employers, the positive results must be apparent to other employers, and the practices must be adaptable to other firms.

1. The National Research Council of the National Academy of Sciences established the Committee on Postsecondary Education and Training in the Workplace to address the role of the federal government in postsecondary training. The project was sponsored by the U.S. Department of Education.

2. Benchmarking is the systematic process of recognizing the "best" management practices and applying them to an organization. TQM is an organizational management approach which includes the following core concepts: doing things right the first time, striving for continuous quality improvement, and understanding and meeting customer needs.

3. The eight workplace practices specified in the survey are: just-in-time inventories; worker teams; total quality management; quality circles; peer review of employee performance; compensation based on a "pay for knowledge" system; employee involvement in the firm's technology and equipment-purchase decisions; and job rotation.

4. Telephone communication, August 3, 1995, Dr. Nancy Kothenbeutal, Executive Director, Eastern Iowa Community College District.

5. Most of this information is adapted from Lisa Lynch, "A Needs Analysis of Training Data: What Do We Want, What Do We Have, Can We Ever Get It?" March, 1995, in the forthcoming book, *Measurement Issues*, edited by J. Haltiwanger, M. Manser, and R. Topel.

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